

REMARKS:

Claims 16-32 are in the case and presented for consideration.

The examiner is respectfully thanked for her efforts identifying allowable subject matter and for contacting applicant's representative to discuss the application. Claims 31 and 32 are presented which are based upon the claim proposed by the examiner.

However, applicant has considered the examiner's suggestions and believes that there is additional protection available for the applicant's invention not covered by the examiner's proposed amendment. Accordingly, claims 16-32 are presented which more clearly recite the applicant's invention and are believed to be patentable over the prior art of record. Claims 16-30 generally recite the subject matter originally contained in claims 1-15, phrased to overcome the several objections to form.

Objections to the Application

The abstract was objected to for improper use of the term "said", among other reasons. Accordingly, the original abstract has been deleted and a replacement abstract which overcomes the objections is provided herewith on a separate page. No new matter has been added.

Rejections Pursuant to §112

Claims 1-15 were rejected pursuant to 35 U.S.C. §112, second paragraph for several instances of unclear or indefinite terms in the claims. Claims 1-15 have been canceled and new claims 16-32 are presented which applicant believes overcome the issues noted in the rejection.

Claims 14 and 15 were further rejected pursuant to 35 U.S.C. §112, first paragraph as reciting subject matter which is not sufficiently well described that one skilled in the art could understand and practice the invention. Each claim included a recitation of, "means designed to lock..." which the Office has found was unclear when read in view of the specification.

Claims 14 and 15 have been canceled, and new claims 29 and 30 recite similar subject matter, but are believed to be in a form which clearly recites the invention in compliance with §112. In particular, the means for locking is recited as a second means for selectively locking the second support against rotation, in accordance with the description in the specification at page 5, lines 18-23. The specification indicates that the locking is accomplished in certain instances following positioning the second support, so that it may be considered "selective" as recited in the claim. Thus, applicant believes it is now clear that the two means are both provided and each means has a different function.

Rejections Pursuant to §§102, 103

Claims 1, 3-7, 9 and 10 were rejected pursuant to 35 U.S.C. §102 as anticipated by the disclosure of U.S. Patent 4,709,465 to Lewis (Lewis '465).

Claims 1-6, 8, 11 and 14 were rejected pursuant to 35 U.S.C. §102 as anticipated by U.S. Patent 5,385,436 to Corsi (Corsi '436).

And, claims 12 and 13 were rejected pursuant to 35 U.S.C. §103 as made obvious from a combination of the teachings of Corsi '436 in view of U.S. Patent 4,652,190 to Corsi (Corsi '190).

Claims 1-5, 14 and 15 were rejected as either anticipated under 35 U.S.C. §102 by U.S. Patent 5,538,375 to Kwapisz (Kwapisz '375) or as made obvious by Kwapisz '375 in combination with U.S. Patent 5,678,291 to Braun.

As noted above, claims 1-15 have been replaced by new claims 16-30. Claims 16-32 are believed to recite the invention in a form which is clearly distinct from the cited patent references. In particular, none of the references teaches a machine tool operating head having a removable chuck, which permits quick switching between tasks when using a tooling machine having what is referred to as 3+2 degrees of freedom of movement. In comparison, applicant has noted that prior machine tools require the entire operating head to be changed to change tools. One skilled in the art would understand that replacing the operating

Not joined
Change
One

head is a very time-consuming job, which sometimes takes hours. In comparison, using the operating head (Fig. 1, element 1) of the invention with a removable chuck (5) permits changing tasks, such as roughing out an object to finish work on the object in a matter of minutes.

It is important to note that applicant's invention provides an operating head for a tooling machine which permits rapid changing of the tool in a machine having 3+2 degrees of freedom of movement. Rather than having to change an operating head having the two degrees of movement, the operating head of the invention has the first support 3 with one degree and the rotatable, removable chuck unit 5 has the second degree of movement.

See
fig.

These features are claimed in each of independent claims 16 and 29. The claims recite the tooling machine support has three degrees of freedom of movement on the Cartesian axes, while the first support and removable chuck account for the second two axes.

In contrast, the Lewis '465 patent, for example, teaches a machine system in which the individual operating heads (spindle heads 54) are interchangeable on the drumhead 36 of ram 20. Lewis '465 states that the spindle heads 54 are operating heads for receiving tools. See, Lewis '465, col. 7, lines 55-65. The ram 20 of Lewis '465 includes shaft 40, which has been equated to

the first support of applicant's claims. But, applicant's respectfully note that shaft 40 is wholly within and forms part of the ram 20, and so cannot constitute a first support part of the operating head, as claimed by applicant.

} No claim language to distinguish

Applicant's claims recite the first support (element 3 in Fig. 1) is part of the operating head, not the structure (sleeve 2 in applicant's specification) capable of movement in the three Cartesian axes.

1st support rotatable fitted to the structure, as is Lewis

Further, in Lewis '465, ram 20 is not an operating head, and spindle heads 54 do not include a removable chuck unit as part of the spindle head 54. The spindle heads/operating heads of Lewis '465 lack a removable chuck unit.

Spindle head is a removable chuck or "tool holding unit"

The rejection based on Lewis '465 relies in part on the disclosure that the spindle heads 54 may be a type which moves in a second or "B" axis. This feature is disclosed in a related patent referenced by Lewis '465. Upon reviewing the referenced document, U.S. Patent 4,370,080 to Goode, differences between applicant's claimed invention and the prior art are made clearer.

The spindle head of Goode '080 is disclosed as a nutating spindle. That is, it does not rotate about the second axis, but merely oscillates or vibrates along the axis.

unclear. No lang to distinguish

The drawings of Goode '080 further illustrate the difference between the operating head claimed by applicant having a removable chuck unit and the spindle heads of Lewis '465. Goode

'080 describes a machine tool head 10 having a housing 30 holding the spindle 21. The head 10 connects to a tooling machine for use. The head 10 is the spindle head 54 of Lewis '465. Goode '080 does not disclose any removable portion or removable chuck unit of the head 10, and clearly shows all of the components are contained within the housing 30, except the cutting tool 12 and external connections to the tooling machine.

Thus, to the extent that Goode '080 is incorporated by reference, Lewis '465 does not anticipate the operating head claimed by applicant, nor does Lewis '465 make the invention obvious. The additional disclosure of Goode '080 does not teach or suggest the invention either, alone or in combination with Lewis '465, since the rotatable, removable chuck unit is not taught or suggested by either reference.

The Corsi '436 and Corsi '190 references similarly fail to teach or suggest the claimed invention.

The Corsi '436 patent discloses an operating head for an automatic machine tool useful for repositioning a tool without giving the appearance of starting and stopping the tool on the workpiece. However, Corsi '436 does not, among other things, teach a removable chuck unit.

The chuck 4 of Corsi '436 is not disclosed as being removable or replaceable. The chuck 4 is disclosed as having supports 3 and 6, neither of which is described as detachable

from the main housing, or separable with the chuck 4. The piston 15, pin 16 and seat 17 are not used to release the chuck 4 to exchange it, but rather to fix the position of the chuck 4 while repositioning the tool.

Corsi '436 contains no indication that the chuck 4 could be removed. In fact, applicant notes that shaft 13, among other components, would prevent removal of the chuck 4 without complete disassembly of the operating head. *Not d.*

Corsi '190 is relied upon only for teaching a dust/chip exhaust system and does not otherwise teach or suggest the invention as claimed.

Therefore, applicant submits that the claims are patentable over these two references as well.

Finally, with respect to the Kwapisz '375 and Braun '291 patents, applicant submits that there are clear differences with the invention recited in claims 16-32. Neither Kwapisz '375 nor Braun '291 teaches a removable or interchangeable chuck unit for their respective milling tool or machine tool. Kwapisz '375 merely teaches a spindle holder 3 and spindle 4 as part of the milling head, but never discloses that they are intended to be separable or that the spindle is changeable. Braun '291 discloses permanent chucks for holding work pieces in opposition to tools, and does not teach or suggest changing the chucks.

Therefore, applicant respectfully submits that none of the

cited references, taken alone or in combination with others, teaches or suggests the claimed invention as now set forth in claims 16-32.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been added.

If any issues remain which may be resolved by telephonic communication, the Examiner is respectfully invited to contact the undersigned at the number below, if such will advance the application to allowance.

Favorable action is respectfully requested.

Respectfully submitted,



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